FETC SUCCESS
U.S. Department of Energy
Federal Energy Technology Center

CLEAN AFFORDABLE POWER

- [x] fossil energy
- [ ] environmental
- [ ] energy efficiency
- [ ] other

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The Piñon Pine Power Project

States Impacted:
California, Nevada, Utah

Benefit Areas:
Clean Power, Energy Independence, Affordable Power

Participants:
Sierra Pacific Power Company, Bechtel, The M.W. Kellogg Company, Foster Wheeler USA Corporation

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Description

The the 100-megawatt Piñon Pine Plant is the first in the U.S. to use advanced hot gas cleanup technology for the entire gasification output. It is also the first to use GE's advanced MS6001FA gas turbine- generator. Sierra Pacific Power Company constructed the plant, which was formally dedicated in April 1998.

For more than 20 years, utility engineers have envisioned power plants that would substitute coal gasifiers for the traditional boilers. Coal gasification produces hot, high-pressure gases that can be cleaned of virtually all of their pollutant-forming impurities, and then used to fuel a combined-cycle power plant (gas turbine and steam turbine), one of the most efficient ways to extract electric power from fossil fuels. In 1995 to 1997, three first-of-a-kind commercial-scale integrated gasification combined-cycle (IGCC) power plants began generating their first electric power under the DOE Clean Coal Technology Program. Capable of reducing sulfur emissions by more than 98 percent and lowering carbon dioxide emissions by 20 to 40 percent (through higher coal-to-electricity efficiencies), these facilities are pioneering a new era in clean power generation from coal.

Goals

The objective is to gasify, rather than burn, coal in a power plant for clean efficient power generation from coal.

Tangible Benefits

National: Efficient power generation will keep the cost of electricity low. Deployment of Piñon Pine Plant designs will provide opportunities to use low-rank and high-sulfur coals for IGCC. Low-rank coals are the most common type of coal throughout the world. These plants will reduce SO_x and NO_x emissions to about 95 percent less than that of conventional pulverized coal plants.

Regional: Limestone is used for in-situ sulfur capture and is purchased regionally. Using limestone also produces usable by-products, improves ash disposal conditioning, and lessens water quality concerns caused by leaching.

Local: The project supports about 20 full-time jobs. Reduced emissions of particulates, SO_x, and NO_x will result in cleaner air than if traditional coal-fired technologies are used to generate the same power.